**General Physics eJournal 6**

**Conservation of Momentum**

**Instructions:**

Follow the Writeup and fill out the eJournal as you complete the lab activities. Submit your eJournal report by uploading the completed WORD or PDF document to our class Learninghub site. If the Learninghub site is down, email the completed report file directly to a lab TA.

**Preliminaries:**

* Title:
* Name(s):
* Date:
* Time In & Out:

**Plan:**

**Hypothesis**

Form a hypothesis regarding conservation of momentum and conservation of kinetic energy for two objects that either collide elastically or collide totally inelastically.

**Experiment Outline**

Briefly describe your plan for testing your hypothesis.

**Equipment List**

* List
* Equipment
* Here

**Action:**

Describe the techniques used to collect data by responding to the bullet point questions:

* How did you measure the mass of your objects?
* Briefly describe your experimental setup. Why was the ruler included?
* What makes the collision either partially elastic or totally inelastic?
* How did you cause the collision?
* What did your video show?

*Insert labeled image of your apparatus*

**Results:**

Record masses and velocities in the following table.

**Table I: Mass and Velocity for Partially Elastic/Totally Inelastic (choose one) Collision**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **m (kg)** | **vi (m/s)** | **vf (m/s)** |
| **Mass 1** |  |  |  |
| **Mass 2** |  |  |  |

*Insert Tracker image of the collision with tracking marks*

**Analysis:**

Compute the initial and final momenta and kinetic energies and record them in Table II. Compute the percentages of momentum and kinetic energy that were lost in the collision.

**Table II: Momentum, Kinetic Energy, and Percent Loss in a Partially Elastic/Totally Inelastic (choose one) Collision**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **pi (kg∙m/s)** | **pf (kg∙m/s)** | **KEi (J)** | **KEf (J)** |
| **Mass 1** |  |  |  |  |
| **Mass 2** |  |  |  |  |
| **Total** |  |  |  |  |
| **%Loss** |  | |  | |

Insert your graph of velocity vs time with the velocities of each mass on the same x-y plot. If you want to, you can also include a graph of position vs time.

*Insert graph of velocity vs time*

**Conclusion:**

Interpret your results in light of your hypothetical predictions. In particular, discuss any losses in kinetic energy you may have noted and the possible origin of these losses. Can you conceive of an experiment in which a totally elastic collision could be arranged? How might you improve this experiment or explore it further?